

**WHAT IS CLAIMED IS:**

1. A means for controlling spindle motor speed of an optical disc reproducing device having a buffer that buffers data reproduced from a disc and reproduces an audio signal, comprising:

an EFM demodulation means for EFM (Eight to Fifteen Modulation)-  
5 demodulating the data read by the disc and outputting EFM data and a WFCK (Write Frame Sync Clock);

a frequency error measurement means for comparing a frequency of the WFCK extracted by the EFM demodulation means with a frequency of a theoretical WFCK and outputting the difference between the extracted WFCK  
10 and the theoretical WFCK as an error value;

a buffering means for storing the EFM data, performing ECC (Error Code Correction) of the stored EFM data and storing transfer data to be transmitted to an external system for reproduction of an audio signal after the ECC;

15 a lead/lag detection means for comparing points in the buffering means where the EFM data is recorded and the transfer data is read, and identifying transfer pointer leads or lags behind an EFM pointer; and

a motor control signal generating means for controlling the rotation speed of the spindle motor that rotates the disc, based on the error value

20 provided by the frequency error measurement means and lead/lag information detected by the lead/lag detection means.

2. The means for controlling spindle motor speed of claim 1, wherein the lead/lag detection means compares the points in the buffering means where the EFM data is recorded and the transfer data is read, and generates the lead signal indicating the transfer pointer is located before the  
5 EFM pointer and the lag signal indicating the transfer pointer is located after the EFM pointer.

3. The means for controlling spindle motor speed of claim 2, wherein the lead/lag detection means generates the lead signal and the lag signal only when the gap between the transfer pointer and the EFM pointer exceeds a prescribed range.

4. The means for controlling spindle motor speed of claim 3, wherein the lead/lag detection means is configured to vary the prescribed range.

5. The means for controlling spindle motor speed of claim 1, wherein the motor control signal generation means adds  $-\alpha$  or  $+\alpha$  to the error value generated by the frequency error measurement means depending on the lead/lag information detected by the lead/lag detection means.

6. A spindle motor speed control apparatus, comprising:

an EFM (Eight to Fifteen Modulation) demodulator that demodulates data reproduced from a disc and outputs EFM data and a WFCK (Write Frame Sync Clock);

5 a frequency error measurement unit that compares a frequency of the WFCK extracted by the EFM demodulator with a frequency of a theoretical WFCK and outputs the difference between the extracted WFCK and the theoretical WFCK as an error value;

10 a buffer that stores the EFM data, performs ECC (Error Code Correction) of the stored EFM data and stores transfer data to be transmitted to an external system for reproduction of an audio signal after the ECC;

a lead/lag detector that compares points in the buffer where the EFM data is recorded and the transfer data is read, and identifies transfer pointer leads or lags behind an EFM pointer; and

15 a motor control signal generator that controls the rotation speed of the spindle motor that rotates the disc, based on the error value provided by the frequency error measurement unit and lead/lag information detected by the lead/lag detector, to reproduce an audio signal.

7. The spindle motor speed control apparatus of claim 6, wherein said spin motor speed control apparatus is coupled to an optical disc reproducing device.

8. The spindle motor speed control apparatus of claim 6, wherein the lead/lag detector generates at least one of a lead signal indicating a transfer pointer is located before the EFM pointer and a lag signal indicating the transfer pointer is located after the EFM pointer.

9. The spindle motor speed control apparatus of claim 8, wherein the lead/lag detector generates the at least one of the lead signal and the lag signal only when the gap between the transfer pointer and the EFM pointer exceeds a prescribed range.

10. The spindle motor speed control apparatus of claim 9, wherein the lead/lag detector is configured to vary the prescribed range.

11. The spindle motor speed control apparatus of claim 6, wherein the motor control signal generator adds  $-\alpha$  or  $+\alpha$  to the error value generated by the frequency error measurement unit depending on the lead/lag information detected by the lead/lag detector.

12. A method of controlling a spindle motor speed, comprising:

(a) demodulating data reproduced from a disc to generate EFM (Eight to Fifteen Modulation) demodulated data and extract a WFCK (Write Frame Sync Clock);

5 (b) comparing a frequency of the extracted WFCK with a frequency of a theoretical WFCK to output an error value comprising a difference between the extracted WFCK and the theoretical WFCK;

(c) buffering the EFM data, performing ECC (Error Code Correction) of the stored EFM data, and storing transfer data to be transmitted to an  
10 external system for reproduction of an audio signal after the ECC;

(d) comparing points where the EFM data is recorded and the transfer data is read to identify transfer pointer leads or lags behind an EFM pointer;  
and

(e) controlling the spindle motor rotation speed based on the error  
15 value and the lead/lag information, to reproduce an audio signal.

13. The method of claim 12, wherein said spindle motor control apparatus is applied to an optical disc reproducing device.

14. The method of claim 12, wherein said (d) generates at least one of a lead signal indicating a transfer pointer is located before the EFM pointer and a lag signal indicating the transfer pointer is located after the EFM pointer.

15. The method of claim 14, wherein said (d) generates the at least one of the lead signal and the lag signal only when the gap between the transfer pointer and the EFM pointer exceeds a prescribed range.

16. The method of claim 15, wherein the prescribed range can be varied.

17. The method of claim 12, wherein said (e) adds  $-\alpha$  or  $+\alpha$  to the error value depending on said pointer leads or lags detected in said (d).